

Simulation of the ALS Longitudinal Feedback System, J. M. BYRD, Lawrence Berkeley Laboratory — Calculations of longitudinal coupled bunch growth rates in the Advanced Light Source (ALS), a 1.5 GeV electron storage ring for producing synchrotron radiation, indicate the need for damping via a feedback (FB) system. The design of the system is based on the PEP-II longitudinal FB system which uses a digital filter to provide the required phase and amplitude response. We report the results of a detailed computer simulation of the FB system including single particle longitudinal beam dynamics, measured RF cavity fundamental and higher order modes, and response of major FB components such as the power amplifier and kicker. The simulation addresses issues such as required FB power and gain, noise, digital filter effects, and varying initial bunch conditions.

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